

MILLIMETER-WAVE DEVICES

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WAVEGUIDE PRODUCTS

X-Band (8.2 to 12.4GHz) WR-90 (UG 39/U)

PRODUCT	DESCRIPTION			MODEL
ATTENUATORS	FULL BAND 8.2-12.4 GHz			
Fixed	3 dB ±0.5 dB		VSWR ≤1.15	FA-90-3
Fixed	6 dB ±1.0 dB		VSWR ≤1.15	FA-90-6
Fixed	10 dB ±1.5 dB		VSWR ≤1.15	FA-90-10
Fixed	20 dB ±2.0 dB		VSWR ≤1.15	FA-90-20
Fixed	30 dB ±3.0 dB		VSWR ≤1.15	FA-90-30
Variable	0.5 to 30 dB (min)		VSWR ≤1.15	VA-90
BENDS - E	E-Plane 90°		VSWR ≤1.15	BE-90
BENDS - H	H-Plane 90°		VSWR ≤1.15	BH-90
CIRCULATORS	(CONTACT DORADO FOR SPECIAL REQUIREMENTS) SEE CATALOG'S FERRITE SECTION			
COUPLERS	FULL BAND 8.2-12.4 GHz			
Cross Guide	Coupling: 20 dB ±2 dB	Directivity ≥15 dB	VSWR ≤1.15	CG-90
Directional	Coupling: 3 dB ±1 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-90-3C
Directional	Coupling: 3 dB ±1 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-90-3D
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-90-6C
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-90-6D
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-90-10C
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-90-10D
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥38 dB	VSWR ≤1.15	DCG-90-10E
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-90-20C
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-90-20D
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥38 dB	VSWR ≤1.15	DCG-90-20E
Directional	Coupling: 40 dB ±3.0 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-90-40C
Directional	Coupling: 40 dB ±3.0 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-90-40D
Directional	Coupling: 40 dB ±3.0 dB	Directivity ≥38 dB	VSWR ≤1.15	DCG-90-40E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band			CD-90
E-H TUNER	8.2-12.4 GHz	Adjustable	VSWR ≤20 to 1.03	EHT-90
PHASE SHIFTER	8.2-12.4 GHz; Variable Phase Shifter; 0° to 180°; VSWR ≤1.15			VPS-90
SHORTS	8.2-12.4 GHz; Tunable: Mechanical Range: 10 mm; VSWR>20:1			TS-90
STRAIGHTS*	FULL BAND 8.2-12.4 GHz *			
	1.0 inch length straight waveguide w/flanges			S-90A
	2.0 inch length straight waveguide w/flanges			S-90B
	3.0 inch length straight waveguide w/flanges			S-90C
	4.0 inch length straight waveguide w/flanges			S-90D
	6.0 inch length straight waveguide w/flanges			S-90F
	12.0 inch length straight waveguide w/flanges			S-90L
TEES	FULL BAND 8.2-12.4 GHz			
E-Plane	Balance ≤0.3 dB	Phase Division: 180°		EPT-90
H-Plane	Balance ≤0.3 dB	Phase Division: 0°		HPT-90
Magic	Bandwidth: 20%	Unsymmetry: ≤0.3 dB	Isolation ≥30 dB	HTW-90
TERMINATION	Power Rating 0.5 W	VSWR ≤1.06		FT-90
TWISTS	FULL BAND 8.2-12.4 GHz			
	90° Waveguide Twist			TW-90-90
	45° Waveguide Twist			TW-90-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.90x0.40 inches)			WR-90(1M)

NOTES:

* - Waveguide straights are available in any length up to 36 inches

DELIVERY:

Most full band devices and some narrow band devices are carried in stock. Non-stock items may require up to 60 days for shipment.

WAVEGUIDE PRODUCTS (10 to 15GHz) WR-75 (UBR-120)

	DESCRIPTION			MODEL
ATTENUATORS	FULL BAND 10.0-15.0 GHz			
Fixed	3 dB ±0.5 dB	VSWR ≤1.15		FA-75-3
Fixed	6 dB ±1.0 dB	VSWR ≤1.15		FA-75-6
Fixed	10 dB ±1.5 dB	VSWR ≤1.15		FA-75-10
Fixed	20 dB ±2.0 dB	VSWR ≤1.15		FA-75-20
Fixed	30 dB ±3.0 dB	VSWR ≤1.15		FA-75-30
Variable	0.5 to 30 dB (min)	VSWR ≤1.15		VA-75
BENDS - E	E-Plane 90°	VSWR ≤1.15		BE-75
BENDS - H	H-Plane 90°	VSWR ≤1.15		BH-75
CIRCULATORS	(CONTACT DORADO FOR SPECIAL REQUIREMENTS) SEE CATALOG'S FERRITE SECTION			
COUPLERS	FULL BAND 10.0-15.0 GHz			
Cross Guide	Coupling: 20 dB ±2 dB	Directivity ≥15 dB	VSWR ≤1.15	CG-75
Directional	Coupling: 3 dB ±1 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-75-3C
Directional	Coupling: 3 dB ±1 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-75-3D
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-75-6C
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-75-6D
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-75-10C
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-75-10D
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥38 dB	VSWR ≤1.15	DCG-75-10E
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-75-20C
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-75-20D
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥38 dB	VSWR ≤1.15	DCG-75-20E
Directional	Coupling: 40 dB ±3.0 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-75-40C
Directional	Coupling: 40 dB ±3.0 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-75-40D
Directional	Coupling: 40 dB ±3.0 dB	Directivity ≥38 dB	VSWR ≤1.15	DCG-75-40E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band			CD-75
E-H TUNER	10.0-15.0 GHz	Adjustable	VSWR ≤20 to 1.03	EHT-75
PHASE SHIFTER	10.0-15.0 GHz; Variable Phase Shifter; 0° to 180°; VSWR ≤1.15			VPS-75
SHORTS	10.0-15.0 GHz; Tunable: Mechanical Range: 10 mm; VSWR>20:1			TS-75
STRAIGHTS*	FULL BAND 10.0-15.0 GHz *			
	1.0 inch length straight waveguide w/flanges			S-75A
	2.0 inch length straight waveguide w/flanges			S-75B
	3.0 inch length straight waveguide w/flanges			S-75C
	4.0 inch length straight waveguide w/flanges			S-75D
	6.0 inch length straight waveguide w/flanges			S-75F
	12.0 inch length straight waveguide w/flanges			S-75L
TEES	FULL BAND 10.0-15.0 GHz			
E-Plane	Balance ≤0.3 dB	Phase Division: 180°		EPT-75
H-Plane	Balance ≤0.3 dB	Phase Division: 0°		HPT-75
Magic	Bandwidth: 20%	Unsymmetry: ≤0.3 dB	Isolation ≥30 dB	HTW-75
TERMINATION	Power Rating 0.5 W	VSWR ≤1.06		FT-75
TWISTS	FULL BAND 10.0-15.0 GHz			
	90° Waveguide Twist			TW-75-90
	45° Waveguide Twist			TW-75-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.75x0.38 inches)			WR-75(1M)

NOTES:

* - Waveguide straights are available in any length up to 36 inches

DELIVERY:

Most full band devices and some narrow band devices are carried in stock. Non-stock items may require up to 60 days for shipment.

WAVEGUIDE PRODUCTS

Ku-Band (12.4 to 18GHz) WR-62 (UG 419/U)

	DESCRIPTION			MODEL
ATTENUATORS	FULL BAND 12.4-18.0 GHz			
Fixed	3 dB ±0.5 dB	VSWR ≤1.15		FA-62-3
Fixed	6 dB ±1.0 dB	VSWR ≤1.15		FA-62-6
Fixed	10 dB ±1.5 dB	VSWR ≤1.15		FA-62-10
Fixed	20 dB ±2.0 dB	VSWR ≤1.15		FA-62-20
Fixed	30 dB ±3.0 dB	VSWR ≤1.15		FA-62-30
Variable	0.5 to 30 dB (min)	VSWR ≤1.15		VA-62
BENDS - E	E-Plane 90°	VSWR ≤1.15		BE-62
BENDS - H	H-Plane 90°	VSWR ≤1.15		BH-62
CIRCULATORS	(CONTACT DORADO FOR SPECIAL REQUIREMENTS) SEE CATALOG'S FERRITE SECTION			
COUPLERS	FULL BAND 12.4-18.0 GHz			
Cross Guide	Coupling: 20 dB ±2 dB	Directivity ≥15 dB	VSWR ≤1.15	CG-62
Directional	Coupling: 3 dB ±1 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-62-3C
Directional	Coupling: 3 dB ±1 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-62-3D
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-62-6C
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-62-6D
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-62-10C
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-62-10D
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥38 dB	VSWR ≤1.15	DCG-62-10E
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-62-20C
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-62-20D
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥38 dB	VSWR ≤1.15	DCG-62-20E
Directional	Coupling: 40 dB ±3.0 dB	Directivity ≥25 dB	VSWR ≤1.15	DCG-62-40C
Directional	Coupling: 40 dB ±3.0 dB	Directivity ≥30 dB	VSWR ≤1.15	DCG-62-40D
Directional	Coupling: 40 dB ±3.0 dB	Directivity ≥38 dB	VSWR ≤1.15	DCG-62-40E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band			CD-62
E-H TUNER	12.4-18.0 GHz	Adjustable	VSWR ≤20 to 1.03	EHT-62
PHASE SHIFTER	12.4-18.0 GHz; Variable Phase Shifter; 0° to 180°; VSWR ≤1.15			VPS-62
SHORTS	12.4-18.0 GHz; Tunable: Mechanical Range: 10 mm; VSWR>20:1			TS-62
STRAIGHTS*	FULL BAND 12.4-18.0 GHz *			
	1.0 inch length straight waveguide w/flanges			S-62A
	2.0 inch length straight waveguide w/flanges			S-62B
	3.0 inch length straight waveguide w/flanges			S-62C
	4.0 inch length straight waveguide w/flanges			S-62D
	6.0 inch length straight waveguide w/flanges			S-62F
	12.0 inch length straight waveguide w/flanges			S-62L
TEES	FULL BAND 12.4-18.0 GHz			
E-Plane	Balance ≤0.3 dB	Phase Division: 180°		EPT-62
H-Plane	Balance ≤0.3 dB	Phase Division: 0°		HPT-62
Magic	Bandwidth: 20%	Unsymmetry: ≤0.3 dB	Isolation ≥30 dB	HTW-62
TERMINATION	Power Rating 0.5 W	VSWR ≤1.06		FT-62
TWISTS	FULL BAND 12.4-18.0 GHz			
	90° Waveguide Twist			TW-62-90
	45° Waveguide Twist			TW-62-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.62x0.31 inches)			WR-62(1M)

NOTES:

* - Waveguide straights are available in any length up to 36 inches

DELIVERY:

Most full band devices and some narrow band devices are carried in stock. Non-stock items may require up to 60 days for shipment.

WAVEGUIDE PRODUCTS (15 to 22GHz) WR-51 (UBR-180)

DESCRIPTION		MODEL
ATTENUATORS	FULL BAND 15.0-22.0 GHz	
Fixed	3 dB ±0.5 dB VSWR ≤1.15	FA-51-3
Fixed	6 dB ±1.0 dB VSWR ≤1.15	FA-51-6
Fixed	10 dB ±1.5 dB VSWR ≤1.15	FA-51-10
Fixed	20 dB ±2.0 dB VSWR ≤1.15	FA-51-20
Fixed	30 dB ±3.0 dB VSWR ≤1.15	FA-51-30
Variable	0.5 to 30 dB (min) VSWR ≤1.15	VA-51
BENDS - E	E-Plane 90° VSWR ≤1.15	BE-51
BENDS - H	H-Plane 90° VSWR ≤1.15	BH-51
CIRCULATORS	(CONTACT DORADO FOR SPECIAL REQUIREMENTS) SEE CATALOG'S FERRITE SECTION	
COUPLERS	FULL BAND 15.0-22.0 GHz	
Cross Guide	Coupling: 20 dB ±2 dB Directivity ≥15 dB VSWR ≤1.20	CG-51
Directional	Coupling: 3 dB ±1 dB Directivity ≥25 dB VSWR ≤1.20	DCG-51-3C
Directional	Coupling: 3 dB ±1 dB Directivity ≥30 dB VSWR ≤1.20	DCG-51-3D
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥25 dB VSWR ≤1.20	DCG-51-6C
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥30 dB VSWR ≤1.20	DCG-51-6D
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥25 dB VSWR ≤1.20	DCG-51-10C
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥30 dB VSWR ≤1.20	DCG-51-10D
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥38 dB VSWR ≤1.20	DCG-51-10E
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥25 dB VSWR ≤1.20	DCG-51-20C
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥30 dB VSWR ≤1.20	DCG-51-20D
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥38 dB VSWR ≤1.20	DCG-51-20E
Directional	Coupling: 40 dB ±3.0 dB Directivity ≥25 dB VSWR ≤1.20	DCG-51-40C
Directional	Coupling: 40 dB ±3.0 dB Directivity ≥30 dB VSWR ≤1.20	DCG-51-40D
Directional	Coupling: 40 dB ±3.0 dB Directivity ≥38 dB VSWR ≤1.20	DCG-51-40E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band	CD-51
E-H TUNER	15.0-22.0 GHz Adjustable VSWR ≤20 to 1.05	EHT-51
PHASE SHIFTER	15.0-22.0 GHz; Variable Phase Shifter; 0° to 180°; VSWR ≤1.15	VPS-51
SHORTS	15.0-22.0 GHz; Tunable; Mechanical Range: 10 mm; VSWR >20:1	TS-51
STRAIGHTS*	FULL BAND 15.0-22.0 GHz *	
	1.0 inch length straight waveguide w/flanges	S-51A
	2.0 inch length straight waveguide w/flanges	S-51B
	3.0 inch length straight waveguide w/flanges	S-51C
	4.0 inch length straight waveguide w/flanges	S-51D
	6.0 inch length straight waveguide w/flanges	S-51F
	12.0 inch length straight waveguide w/flanges	S-51L
TEES	FULL BAND 15.0-22.0 GHz	
E-Plane	Balance ≤0.3 dB Phase Division: 180°	EPT-51
H-Plane	Balance ≤0.3 dB Phase Division: 0°	HPT-51
Magic	Bandwidth: 20% Unsymmetry: ≤0.3 dB Isolation ≥30 dB	HTW-51
TERMINATION	Power Rating 0.5 W VSWR ≤1.06	FT-51
TWISTS	FULL BAND 15.0-22.0 GHz	
	90° Waveguide Twist	TW-51-90
	45° Waveguide Twist	TW-51-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.51x0.26 inches)	WR-51(1M)

NOTES:

* - Waveguide straights are available in any length up to 36 inches

DELIVERY:

Most full band devices and some narrow band devices are carried in stock. Non-stock items may require up to 60 days for shipment.

ABBREVIATIONS:

B/W = Bandwidth;
PWR = Power

MILLIMETER WAVEGUIDE PRODUCTS K-BAND (18 to 26.5GHz) WR-42 (UG 595/U)

DESCRIPTION		MODEL		
ATTENUATORS	FULL BAND 18-26.5 GHz			
Fixed	3 dB ±0.5 dB	VSWR ≤1.15	FA-42-3	
Fixed	6 dB ±1.0 dB	VSWR ≤1.15	FA-42-6	
Fixed	10 dB ±1.5 dB	VSWR ≤1.15	FA-42-10	
Fixed	20 dB ±2.0 dB	VSWR ≤1.15	FA-42-20	
Fixed	30 dB ±3.0 dB	VSWR ≤1.15	FA-42-30	
Variable	0.5 to 30 dB (min)	VSWR ≤1.15	VA-42	
BENDS - E	E-Plane 90°	VSWR ≤1.15	BE-42	
BENDS - H	H-Plane 90°	VSWR ≤1.15	BH-42	
COUPLERS	FULL BAND 18-26.5 GHz			
Cross Guide	Coupling: 20 dB ±2 dB	Directivity ≥15 dB	VSWR ≤1.20	CG-42
Directional	Coupling: 3 dB ±1 dB	Directivity ≥25 dB	VSWR ≤1.20	DCG-42-3C
Directional	Coupling: 3 dB ±1 dB	Directivity ≥30 dB	VSWR ≤1.20	DCG-42-3D
Directional	Coupling: 3 dB ±1 dB	Directivity ≥40 dB	VSWR ≤1.20	DCG-42-3E
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥25 dB	VSWR ≤1.20	DCG-42-6C
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥30 dB	VSWR ≤1.20	DCG-42-6D
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥40 dB	VSWR ≤1.20	DCG-42-6E
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥25 dB	VSWR ≤1.20	DCG-42-10C
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥30 dB	VSWR ≤1.20	DCG-42-10D
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥40 dB	VSWR ≤1.20	DCG-42-10E
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥25 dB	VSWR ≤1.20	DCG-42-20C
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥30 dB	VSWR ≤1.20	DCG-42-20D
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥40 dB	VSWR ≤1.20	DCG-42-20E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band		CD-42	
E-H TUNER	18-26.5 GHz	Adjustable	VSWR ≤20:1 to 1.05:1	EHT-42
LOADS	FULL BAND 18-26.5 GHz			
Terminations	Power Rating: 0.5 W	VSWR ≤1.06	FT-42	
Low Power	Power Rating: 10 W	VSWR ≤1.10	HPL-42-10	
Medium Power	Power Rating: 100 W;	VSWR ≤1.10	HPL-42-100	
High Power	Power Rating: 200 W;	VSWR ≤1.15	HPL-42-200	
High Power	Power Rating: 500 W;	VSWR ≤1.15	HPL-42-500	
PHASE SHIFTER	18-26.5 GHz; Variable Phase Shifter; 0° to 180°; VSWR ≤1.15			VPS-42
SHORTS	18-26.5 GHz; Tunable: Mechanical Range: 10 mm; VSWR>20:1			TS-42
SLIDE TUNER	18-26.5 GHz; Slide Screw Tuner; VSWR: 20 to 1.03			SST-42
STANDS	Waveguide Stands (Adjustable Height)			STW-42
STRAIGHTS*	FULL BAND 18-26.5 GHz *			
	1.0 inch length straight waveguide w/flanges		S-42A	
	2.0 inch length straight waveguide w/flanges		S-42B	
	3.0 inch length straight waveguide w/flanges		S-42C	
	4.0 inch length straight waveguide w/flanges		S-42D	
	6.0 inch length straight waveguide w/flanges		S-42F	
SWITCHES	SINGLE POLE DOUBLE THROW - 18-26.5 GHz			
Mechanical	S.P.D.T.	3 Port	E-Plane	EPS-42
Mechanical	S.P.D.T.	3 Port	H-Plane	HPS-42
Magic	Bandwidth: 20%	Unsymmetry: ≤0.5 dB	Isolation ≥30 dB	HTW-42

MILLIMETER WAVEGUIDE PRODUCTS K-BAND (18-26.5GHz) WR-42 (UG 595/U)

DESCRIPTION	MODEL
TEES	FULL BAND 18-26.5 GHz
E-Plane	Balance ≤ 0.3 dB Phase Division: 180°
H-Plane	Balance ≤ 0.3 dB Phase Division: 0°
E-H Plane	Balance: ≤ 0.3 dB; Phase Division: E= 180° /H= 0°
Magic	Bandwidth: 20% Unsymmetry: ≤ 0.5 dB Isolation ≥ 30 dB
TRANSITIONS	Cosine Function Electroformed Transition WR-28 to WR-42
	Linear Transition WR-62 to WR-42
	Linear Transition WR-34 to WR-42
	Linear Transition WR-28 to WR-42
TWISTS	FULL BAND 18-26.5 GHz
	90° Waveguide Twist
	45° Waveguide Twist
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.42x0.17 inches)

NOTES:

* - Waveguide straights are available in any length up to 36 inches

WARRANTY:

All products purchased from “Dorado” are warranted to meet the published specifications and to be free from defects in workmanship and materials for a period of 12 months from date of delivery.

DELIVERY:

Most full band devices and some narrow band devices are carried in stock. Non-stock items may require up to 60 days for shipment.

ABBREVIATIONS:

B/W = Bandwidth;
PWR = Power

MILLIMETER WAVEGUIDE PRODUCTS (22 to 33GHz) *WR-34 (UG 1530/U)*

DESCRIPTION		MODEL
ATTENUATORS	FULL BAND 22.0-33.0 GHz	
Fixed	3 dB \pm 0.5 dB VSWR \leq 1.15	FA-34-3
Fixed	6 dB \pm 1.0 dB VSWR \leq 1.15	FA-34-6
Fixed	10 dB \pm 1.5 dB VSWR \leq 1.15	FA-34-10
Fixed	20 dB \pm 2.0 dB VSWR \leq 1.15	FA-34-20
Fixed	30 dB \pm 3.0 dB VSWR \leq 1.15	FA-34-30
Variable	0.5 to 30 dB (min) VSWR \leq 1.15	VA-34
BENDS - E	E-Plane 90° VSWR \leq 1.15	BE-34
BENDS - H	H-Plane 90° VSWR \leq 1.15	BH-34
COUPLERS	FULL BAND 22.0-33.0 GHz	
Cross Guide	Coupling: 20 dB \pm 2 dB Directivity \geq 15 dB VSWR \leq 1.20	CG-34
Directional	Coupling: 3 dB \pm 1 dB Directivity \geq 25 dB VSWR \leq 1.20	DCG-34-3C
Directional	Coupling: 3 dB \pm 1 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-34-3D
Directional	Coupling: 6 dB \pm 1.2 dB Directivity \geq 25 dB VSWR \leq 1.20	DCG-34-6C
Directional	Coupling: 6 dB \pm 1.2 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-34-6D
Directional	Coupling: 10 dB \pm 1.5 dB Directivity \geq 25 dB VSWR \leq 1.20	DCG-34-10C
Directional	Coupling: 10 dB \pm 1.5 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-34-10D
Directional	Coupling: 10 dB \pm 1.5 dB Directivity \geq 38 dB VSWR \leq 1.20	DCG-34-10E
Directional	Coupling: 20 dB \pm 2.0 dB Directivity \geq 25 dB VSWR \leq 1.20	DCG-34-20C
Directional	Coupling: 20 dB \pm 2.0 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-34-20D
Directional	Coupling: 20 dB \pm 2.0 dB Directivity \geq 38 dB VSWR \leq 1.20	DCG-34-20E
Directional	Coupling: 40 dB \pm 3.0 dB Directivity \geq 25 dB VSWR \leq 1.20	DCG-34-40C
Directional	Coupling: 40 dB \pm 3.0 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-34-40D
Directional	Coupling: 40 dB \pm 3.0 dB Directivity \geq 38 dB VSWR \leq 1.20	DCG-34-40E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band	CD-34
E-H TUNER	22.0-33.0 GHz Adjustable VSWR \leq 20 to 1.05	EHT-34
PHASE SHIFTER	22.0-33.0 GHz; Variable Phase Shifter; 0° to 180°; VSWR \leq 1.15	VPS-34
SHORTS	22.0-33.0 GHz; Tunable; Mechanical Range: 10 mm; VSWR >20:1	TS-34
STRAIGHTS*	FULL BAND 22.0-33.0 GHz *	
	1.0 inch length straight waveguide w/flanges	S-34A
	2.0 inch length straight waveguide w/flanges	S-34B
	3.0 inch length straight waveguide w/flanges	S-34C
	4.0 inch length straight waveguide w/flanges	S-34D
	6.0 inch length straight waveguide w/flanges	S-34F
	12.0 inch length straight waveguide w/flanges	S-34L
TEES	FULL BAND 22.0-33.0 GHz	
E-Plane	Balance \leq 0.3 dB Phase Division: 180°	EPT-34
H-Plane	Balance \leq 0.3 dB Phase Division: 0°	HPT-34
Magic	Bandwidth: 20% Unsymmetry: \leq 0.3 dB Isolation \geq 30 dB	HTW-34
TERMINATION	Power Rating 0.5 W VSWR \leq 1.06	FT-34
TWISTS	FULL BAND 22.0-33.0 GHz	
	90° Waveguide Twist	TW-34-90
	45° Waveguide Twist	TW-34-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.34x0.17 inches)	WR-34(1M)

NOTES:

* - Waveguide straights are available in any length up to 36 inches

DELIVERY:

Most full band devices and some narrow band devices are carried in stock. Non-stock items may require up to 60 days for shipment.

ABBREVIATIONS:

B/W = Bandwidth;
 PWR = Power

MILLIMETER WAVEGUIDE PRODUCTS KA-BAND (26.5 to 40GHz) WR-28 (UG 599/U)

DESCRIPTION		MODEL
ATTENUATORS	FULL BAND 26.5-40 GHz	
Fixed	3 dB \pm 0.5 dB; VSWR \leq 1.15	FA-28-3
Fixed	6 dB \pm 1.0 dB; VSWR \leq 1.15	FA--28-6
Fixed	10 dB \pm 1.5 dB; VSWR \leq 1.15	FA-28-10
Fixed	20 dB \pm 2.0 dB; VSWR \leq 1.15	FA-28-20
Fixed	30 dB \pm 3.0 dB; VSWR \leq 1.15	FA-28-30
Variable	0.5 to 30 dB (min); VSWR \leq 1.15	VA-28
BENDS - E	E-Plane 90° VSWR \leq 1.15	BE-28
BENDS - H	H-Plane 90° VSWR \leq 1.15	BH-28
COUPLERS	FULL BAND 26.5-40 GHz	
Cross Guide	Coupling: 20 dB \pm 2 dB Directivity \geq 15 dB VSWR \leq 1.20	CG-28
Directional	Coupling: 3 dB \pm 1 dB Directivity \geq 25 dB VSWR \leq 1.20	DCG-28-3C
Directional	Coupling: 3 dB \pm 1 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-28-3D
Directional	Coupling: 3 dB \pm 1 dB Directivity \geq 40 dB VSWR \leq 1.20	DCG-28-3E
Directional	Coupling: 6 dB \pm 1.2 dB Directivity \geq 25 dB VSWR \leq 1.20	DCG-28-6C
Directional	Coupling: 6 dB \pm 1.2 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-28-6D
Directional	Coupling: 6 dB \pm 1.2 dB Directivity \geq 40 dB VSWR \leq 1.20	DCG-28-6E
Directional	Coupling: 10 dB \pm 1.5 dB Directivity \geq 25 dB VSWR \leq 1.20	DCG-28-10C
Directional	Coupling: 10 dB \pm 1.5 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-28-10D
Directional	Coupling: 10 dB \pm 1.5 dB Directivity \geq 40 dB VSWR \leq 1.20	DCG-28-10E
Directional	Coupling: 20 dB \pm 2.0 dB Directivity \geq 25 dB VSWR \leq 1.20	DCG-28-20C
Directional	Coupling: 20 dB \pm 2.0 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-28-20D
Directional	Coupling: 20 dB \pm 2.0 dB Directivity \geq 40 dB VSWR \leq 1.20	DCG-28-20E
Directional	Coupling: 30 dB \pm 3.0 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-28-30D
Directional	Coupling: 40 dB \pm 4.0 dB Directivity \geq 30 dB VSWR \leq 1.20	DCG-28-40D
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band 26.5-40 GHz	CD-28
E-H TUNER	26.5-40 GHz Adjustable VSWR \leq 20:1 to 1.05:1	EHT-28
LOADS	FULL BAND 26.5-40 GHz	
Terminations	Power Rating: 0.5 W VSWR \leq 1.06	FT-28
Low Power	Power Rating: 10 W VSWR \leq 1.10	HPL-28-10
Medium Power	Power Rating: 100 W VSWR \leq 1.10	HPL-28-100
Power	Power Rating: 200 W VSWR \leq 1.15	HPL-28-200
High Power	Power Rating: 500 W VSWR \leq 1.15	HPL-28-500
PHASE SHIFTER	26.5-40 GHz; Variable Phase Shifter; 0° to 180°; VSWR \leq 1.15	VPS-28
SHORTS	26.5-40 GHz; Tunable: Mechanical Range: 10 mm; VSWR $>$ 20:1	TS-28
SLIDE TUNER	26.5-40 GHz Slide Screw Tuner VSWR: 20 to 1.03:1	SST-28
STANDS	Waveguide Stands (Adjustable Height)	STW-28
STRAIGHTS*	FULL BAND 26.5-40 GHz*	
	1.0 inch length straight waveguide w/flanges	S-28A
	2.0 inch length straight waveguide w/flanges	S-28B
	3.0 inch length straight waveguide w/flanges	S-28C
	4.0 inch length straight waveguide w/flanges	S-28D
	6.0 inch length straight waveguide w/flanges	S-28F

MILLIMETER WAVEGUIDE PRODUCTS KA-BAND (26.5 to 40GHz) WR-28 (UG 599/U)

DESCRIPTION	MODEL
TEES	FULL BAND 26.5-40 GHz
E-Plane	Balance ≤ 0.3 dB Phase Division: 180° EPT-28
H-Plane	Balance ≤ 0.3 dB Phase Division: 0° HPT-28
E-H Plane	Balance: ≤ 0.3 dB Phase Division: E=180°/H=0° EHW-28
Magic	Bandwidth: 20% Unsymmetry: ≤ 0.5 dB Isolation ≥ 30 dB HTW-28
TRANSITIONS	WAVEGUIDE TO WAVEGUIDE
	Linear Transition WR-28 to WR-28 WLT28-28
	Linear Transition WR-34 to WR-28 WLT28-34
	Linear Transition WR-62 to WR-28 WLT28-62
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-90 WT28-90
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-62 WT28-62
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-42 WT28-42
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-22 WT28-22
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-19 WT28-19
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-15 WT28-15
	Low Loss Cosine Function Electroformed Transition WR28 to WR-12 WT28-12
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-10 WT28-10
	Low Loss Cosine Function Electroformed Transition WR28 to WR-8 WT28-8
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-6 WT28-6
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-5 WT28-5
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-4 WT28-4
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-3 WT28-3
TWISTS	FULL BAND 26.5-40 GHz
	90° Waveguide Twist TW-28-90
	45° Waveguide Twist TW-28-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.28x0.17 inches) WR-28(1M)

NOTES:

* - Waveguide straights are available in any length up to 36 inches

DELIVERY:

Most full band devices and some narrow band devices are carried in stock. Non-stock items may require up to 60 days for shipment.

ABBREVIATIONS:

B/W = Bandwidth;
PWR = Power

MILLIMETER WAVEGUIDE PRODUCTS Q-BAND (33 to 50GHz) WR-22 (UG 383/U)

DESCRIPTION		MODEL
ATTENUATORS	FULL BAND 33-50 GHz	
Fixed	3 dB ±0.5 dB	VSWR ≤1.15 FA-22-3
Fixed	6 dB ±1.0 dB	VSWR ≤1.15 FA--22-6
Fixed	10 dB ±1.5 dB	VSWR ≤1.15 FA-22-10
Fixed	20 dB ±2.0 dB	VSWR ≤1.15 FA-22-20
Fixed	30 dB ±3.0 dB	VSWR ≤1.15 FA-22-30
Variable	0.5 to 30 dB (min)	VSWR ≤1.15 VA-22
BENDS – E	E-Plane 90°	VSWR ≤1.15 BE-22
BENDS – H	H-Plane 90°	VSWR ≤1.15 BH-22
COUPLERS	FULL BAND 33-50 GHz	
Cross Guide	Coupling: 20 dB ±2 dB	Directivity ≥15 dB VSWR ≤ 1.20 CG-22
Directional	Coupling: 3 dB ±1 dB	Directivity ≥25 dB VSWR ≤1.20 DCG-22-3C
Directional	Coupling: 3 dB ±1 dB	Directivity ≥30 dB VSWR ≤1.20 DCG-22-3D
Directional	Coupling: 3 dB ±1 dB	Directivity ≥40 dB VSWR ≤1.20 DCG-22-3E
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥25 dB VSWR ≤1.20 DCG-22-6C
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥30 dB VSWR ≤1.20 DCG-22-6D
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥40 dB VSWR ≤1.20 DCG-22-6E
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥25 dB VSWR ≤1.20 DCG-22-10C
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥30 dB VSWR ≤1.20 DCG-22-10D
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥40 dB VSWR ≤1.20 DCG-22-10E
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥25 dB VSWR ≤1.20 DCG-22-20C
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥30 dB VSWR ≤1.20 DCG-22-20D
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥40 dB VSWR ≤1.20 DCG-22-20E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band CD-22	
E-H TUNER	33-50 GHz	Adjustable VSWR: 20:1 to 1.05:1 EHT-22
PHASE SHIFTER	33-50 GHz; Variable Phase Shifter; 0° to 180°; VSWR ≤1.15 VPS-22	
LOADS	FULL BAND 33-50 GHz	
Terminations	Power Rating: 0.5 W	VSWR ≤1.06 FT-22
Low Power	Power Rating: 10 W	VSWR ≤1.10 HPL-22-10
Medium Power	Power Rating: 100 W	VSWR ≤1.10 HPL-22-100
High Power	Power Rating: 200 W	VSWR ≤1.15 HPL-22-200
High Power	Power Rating: 500 W	VSWR ≤1.15 HPL-22-500
SHORTS	33-50 GHz; Tunable: Mechanical Range: 10 mm; VSWR>20:1 TS-22	
SLIDE TUNER	33-50 GHz	Slide Screw Tuner VSWR: 20 to 1.03:1 SST-22
STANDS	Waveguide Stands (Adjustable Height) STW-28	
STRAIGHTS*	FULL BAND 33-50 GHz*	
	1.0 inch length straight waveguide w/flanges	S-22A
	2.0 inch length straight waveguide w/flanges	S-22B
	3.0 inch length straight waveguide w/flanges	S-22C
	4.0 inch length straight waveguide w/flanges	S-22D
	6.0 inch length straight waveguide w/flanges	S-22F
TEES	FULL BAND 33-50 GHz	
E-Plane	Balance: ≤0.3 dB	Phase Division: 180° EPT-22
H-Plane	Balance: ≤0.3 dB	Phase Division: 0° HPT-22
E-H Plane	Balance: ≤0.3 dB	Phase Division: E=180°/H=0° EHW-22
Magic	Bandwidth: 20%	Unsymmetry: ≤0.5 dB Isolation: 30 dB HTW-22

MILLIMETER WAVEGUIDE PRODUCTS Q-BAND (33 to 50GHz) WR-22 (UG 383/U)

PRODUCT	DESCRIPTION	MODEL
TRANSITIONS	WAVEGUIDE TO WAVEGUIDE	
	Low Loss Cosine Function Electroformed Transition WR-22 to WR-19	WT-22-19
	Low Loss Cosine Function Electroformed Transition	WT-28-22
	Linear Waveguide Transition WLT-22 to WR-19	WLT-22-19
	Linear Waveguide Transition WR-28 to WR-22 (50mm length)	WLT-28-22
TWISTS	FULL BAND 33-50 GHz	
	90° Waveguide Twist	TW-22-90
	45° Waveguide Twist	TW-22-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.22x0.17 inches)	WR-22(1M)

NOTES:

* - Waveguide straights are available in any length up to 36 inches

DELIVERY:

Most full band devices and some narrow band devices are carried in stock. Non-stock items may require up to 60 days for shipment.

ABBREVIATIONS:

B/W = Bandwidth;

PWR = Power

MILLIMETER WAVEGUIDE PRODUCTS U-Band (40 to 60GHz) WR-19 (UG 383/UM)

PRODUCT	DESCRIPTION			MODEL
ATTENUATORS	FULL BAND 40-60 GHz			
Fixed	3 dB ±0.5 dB		VSWR ≤1.15	FA-19-3
Fixed	6 dB ±1.0 dB		VSWR ≤1.15	FA--19-6
Fixed	10 dB ±1.5 dB		VSWR ≤1.15	FA-19-10
Fixed	20 dB ±2.0 dB		VSWR ≤1.15	FA-19-20
Fixed	30 dB ±3.0 dB		VSWR ≤1.15	FA-19-30
Variable	0.5 to 30 dB (min)		VSWR ≤1.15	VA-19
BENDS - E	E-Plane 90°			BE-19
BENDS - H	H-Plane 90°			BH-19
COUPLERS	FULL BAND 40-60 GHz			
Cross Guide	Coupling: 20 dB ±2 dB	Directivity ≥15 dB	VSWR ≤1.20	CG-19
Directional	Coupling: 3 dB ±1 dB	Directivity ≥25 dB	VSWR ≤1.20	DCG-19-3C
Directional	Coupling: 3 dB ±1 dB	Directivity ≥30 dB	VSWR ≤1.20	DCG-19-3D
Directional	Coupling: 3 dB ±1 dB	Directivity ≥40 dB	VSWR ≤1.20	DCG-19-3E
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥25 dB	VSWR ≤1.20	DCG-19-6C
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥30 dB	VSWR ≤1.20	DCG-19-6D
Directional	Coupling: 6 dB ±1.2 dB	Directivity ≥40 dB	VSWR ≤1.20	DCG-19-6E
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥25 dB	VSWR ≤1.20	DCG-19-10C
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥30 dB	VSWR ≤1.20	DCG-19-10D
Directional	Coupling: 10 dB ±1.5 dB	Directivity ≥40 dB	VSWR ≤1.20	DCG-19-10E
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥25 dB	VSWR ≤1.20	DCG-19-20C
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥30 dB	VSWR ≤1.20	DCG-19-20D
Directional	Coupling: 20 dB ±2.0 dB	Directivity ≥40 dB	VSWR ≤1.20	DCG-19-20E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band			CD-19
E-H TUNER	40-60 GHz	Adjustable	VSWR: 10:1 to 1.05:1	EHT-19
LOADS	FULL BAND 40-60 GHz			
Terminations	Power Rating: 0.5 W		VSWR: 1.06:1	FT-19
Low Power	Power Rating: 10 W		VSWR: 1.10:1	HPL-19-10
Medium Power	Power Rating: 100 W		VSWR: 1.10:1	HPL-19-100
High Power	Power Rating: 200 W		VSWR: 1.15:1	HPL-19-200
High Power	Power Rating: 500 W		VSWR: 1.15:1	HPL-19-500
PHASE SHIFTER	40-60 GHz; Variable Phase Shifter; 0° to 180°; VSWR: 1.15			VPS-19
SHORTS	40-60 GHz; Tunable: Mechanical Range: 10 mm; VSWR>20:1			TS-19
STANDS	Waveguide Stands (Adjustable Height)			STW-28
STRAIGHTS*	FULL BAND 40-60 GHz*			
	1.0 inch length straight waveguide w/flanges			S-19A
	2.0 inch length straight waveguide w/flanges			S-19B
	3.0 inch length straight waveguide w/flanges			S-19C
	4.0 inch length straight waveguide w/flanges			S-19D
	6.0 inch length straight waveguide w/flanges			S-19F
TEES	FULL BAND 40-60 GHz			
E-Plane	Balance: ≤0.3 dB	Phase Division: 180°		EPT-19
H-Plane	Balance: ≤0.3 dB	Phase Division: 0°		HPT-19
E-H Plane	Balance: ≤0.3 dB	Phase Division: E=180°/H=0°		EHW-19
Magic	Bandwidth: 20%; ≤Unsymmetry: ≤0.5 dB; Isolation: 30 dB			HTW-19
TRANSITIONS	WAVEGUIDE TO WAVEGUIDE			
	Low Loss Cosine Function Electroformed Transition WR-19 to WR-15			WT19-15
	Low Loss Cosine Function Electroformed Transition WR-22 to WR-19			WT22-19
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-19			WT28-19
TWISTS	FULL BAND 40-60 GHz			
	90° Waveguide Twist			TW-19-90
	45° Waveguide Twist			TW-19-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.19x0.17 inches)			WR-19(1M)

MILLIMETER WAVEGUIDE PRODUCTS V-Band (50 to 75GHz) WR-15 (UG 385/U)

DESCRIPTION		MODEL
ATTENUATORS	FULL BAND 50-75 GHz	
Fixed	3 dB ±0.5 dB VSWR ≤1.15	FA-15-3
Fixed	6 dB ±1.0 dB VSWR ≤1.15	FA--15-6
Fixed	10 dB ±1.5 dB VSWR ≤1.15	FA-15-10
Fixed	20 dB ±2.0 dB VSWR ≤1.15	FA-15-20
Fixed	30 dB ±3.0 dB VSWR ≤1.15	FA-15-30
Variable	0.5 to 30 dB (min) VSWR ≤1.15	VA-15
BENDS - E	E-Plane 90° VSWR ≤1.15	BE-15
BENDS - H	H-Plane 90° VSWR ≤1.15	BH-15
COUPLERS	FULL BAND 50-75 GHz	
Cross Guide	Coupling: 20 dB ±2 dB Directivity ≥15 dB VSWR ≤1.20	CG-15
Directional	Coupling: 3 dB ±1 dB Directivity ≥25 dB VSWR ≤1.20	DCG-15-3C
Directional	Coupling: 3 dB ±1 dB Directivity ≥30 dB VSWR ≤1.20	DCG-15-3D
Directional	Coupling: 3 dB ±1 dB Directivity ≥40 dB VSWR ≤1.20	DCG-15-3E
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥25 dB VSWR ≤1.20	DCG-15-6C
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥30 dB VSWR ≤1.20	DCG-15-6D
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥40 dB VSWR ≤1.20	DCG-15-6E
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥25 dB VSWR ≤1.20	DCG-15-10C
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥30 dB VSWR ≤1.20	DCG-15-10D
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥40 dB VSWR ≤1.20	DCG-15-10E
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥25 dB VSWR ≤1.20	DCG-15-20C
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥30 dB VSWR ≤1.20	DCG-15-20D
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥40 dB VSWR ≤1.20	DCG-15-20E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band	CD-15
E-H TUNER	50-75 GHz Adjustable VSWR: 10:1 to 1.05:1	EHT-15
LOADS	FULL BAND 50-75 GHz	
Terminations	Power Rating: 0.5 W VSWR ≤1.06	FT-15
Low Power	Power Rating: 10 W VSWR ≤1.10	HPL-15-10
Medium Power	Power Rating: 100 W VSWR ≤1.10	HPL-15-100
High Power	Power Rating: 200 W VSWR ≤1.15	HPL-15-200
High Power	Power Rating: 500 W VSWR ≤1.15	HPL-15-500
PHASE SHIFTER	50-75 GHz; Variable Phase Shifter; 0° to 180°; VSWR ≤1.15	VPS-15
SHORTS	50-75 GHz; Tunable: Mechanical Range: 10 mm; VSWR>20:1	TS-15
STANDS	Waveguide Stands (Adjustable Height)	STW-28
STRAIGHTS*	FULL BAND 50-75 GHz*	
	1.0 inch length straight waveguide w/flanges	S-15A
	2.0 inch length straight waveguide w/flanges	S-15B
	3.0 inch length straight waveguide w/flanges	S-15C
	4.0 inch length straight waveguide w/flanges	S-15D
	6.0 inch length straight waveguide w/flanges	S-15F
TEES	FULL BAND 50-75 GHz	
E-Plane	Balance: ≤0.3 dB Phase Division: 180°	EPT-15
H-Plane	Balance: ≤0.3 dB Phase Division: 0°	HPT-15
Magic	Bandwidth: 20% Unsymmetry: ≤0.5 dB Isolation: 30 dB	HTW-15
TRANSITIONS	WAVEGUIDE TO WAVEGUIDE	
	Low Loss Cosine Function Electroformed Transition WR-10 to WR-15	WT10-15
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-15	WT28-15
	Low Loss Cosine Function Electroformed Transition WR-90 to WR-15	WT90-15
TWISTS	FULL BAND 50-75 GHz	
	90° Waveguide Twist	TW-15-90
	45° Waveguide Twist	TW-15-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.15x0.17 inches)	WR-15(1M)

MILLIMETER WAVEGUIDE PRODUCTS E-Band (60 to 90GHz) WR-12 (UG 387/U)

DESCRIPTION		MODEL
ATTENUATORS	FULL BAND 60-90 GHz	
Fixed	3 dB ±0.5 dB; VSWR ≤1.15	FA-12-3
Fixed	6 dB ±1.0 dB; VSWR ≤1.15	FA--12-6
Fixed	10 dB ±1.5 dB; VSWR ≤1.15	FA-12-10
Fixed	20 dB ±2.0 dB; VSWR ≤1.15	FA-12-20
Fixed	30 dB ±3.0 dB; VSWR ≤1.15	FA-12-30
Variable	0.5 to 30 dB (min); VSWR ≤1.15	VA-12
BENDS – E	E-Plane 90°	BE-12
BENDS – H	H-Plane 90°	BH-12
COUPLERS	FULL BAND 60-90 GHz	
Cross Guide	Coupling: 20 dB ±2 dB Directivity ≥15 dB VSWR ≤1.20	CG-12
Directional	Coupling: 3 dB ±1 dB Directivity ≥25 dB VSWR ≤1.20	DCG-12-3C
Directional	Coupling: 3 dB ±1 dB Directivity ≥30 dB VSWR ≤1.20	DCG-12-3D
Directional	Coupling: 3 dB ±1 dB Directivity ≥40 dB VSWR ≤1.20	DCG-12-3E
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥25 dB VSWR ≤1.20	DCG-12-6C
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥30 dB VSWR ≤1.20	DCG-12-6D
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥40 dB VSWR ≤1.20	DCG-12-6E
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥25 dB VSWR ≤1.20	DCG-12-10C
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥30 dB VSWR ≤1.20	DCG-12-10D
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥40 dB VSWR ≤1.20	DCG-12-10E
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥25 dB VSWR ≤1.20	DCG-12-20C
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥30 dB VSWR ≤1.20	DCG-12-20D
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥40 dB VSWR ≤1.20	DCG-12-20E
E-H TUNER	60-90 GHz Adjustable VSWR: 1.05 to 6.0	EHT-12
LOADS	FULL BAND 60-90 GHz	
Terminations	Power Rating: 0.5 W; VSWR ≤1.06	FT-12
Low Power	Power Rating: 10 W; VSWR ≤1.12	HPL-12-10
Medium Power	Power Rating: 100 W; VSWR ≤1.12	HPL-12-100
High Power	Power Rating: 200 W; VSWR ≤1.20	HPL-12-200
High Power	Power Rating: 500 W; VSWR ≤1.20	HPL-12-500
PHASE SHIFTER	60-90 GHz; Variable Phase Shifter; 0° to 180°; VSWR ≤1.20	VPS-12
SHORTS*	60-90 GHz; Tunable: Mechanical Range: 10 mm; VSWR>15:1*	TS-12
STANDS	Waveguide Stands (Adjustable Height)	STW-28
STRAIGHTS*	FULL BAND 60-90 GHz*	
	1.0 inch length straight waveguide w/flanges	S-12A
	2.0 inch length straight waveguide w/flanges	S-12B
	3.0 inch length straight waveguide w/flanges	S-12C
	4.0 inch length straight waveguide w/flanges	S-12D
	6.0 inch length straight waveguide w/flanges	S-12F
TEES	FULL BAND 60-90 GHz	
E-Plane	Balance: ≤0.3 dB Phase Division: 180°	EPT-12
H-Plane	Balance: ≤0.3 dB Phase Division: 0°	HPT-12
E-H Plane	Balance: ≤0.3 dB Phase Division: E=180°/H=0°	EHW-12
Magic	Bandwidth: 20% Unsymmetry: ≤0.5 dB Isolation: 30 dB	HTW-12
TRANSITIONS	WAVEGUIDE TO WAVEGUIDE	
	Low Loss Cosine Function Electroformed Transition WR-10 to WR-12	WT10-12
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-12	WT28-12
	Low Loss Cosine Function Electroformed Transition WR-90 to WR-12	WT90-12
TWISTS	FULL BAND 60-90 GHz	
	90° Waveguide Twist	TW-12-90
	45° Waveguide Twist	TW-12-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.12x0.17 inches)	WR-12(1M)

MILLIMETER WAVEGUIDE PRODUCTS W-Band (75 to 110GHz) WR-10 (UG 387/UM)

DESCRIPTION		MODEL
ATTENUATORS	FULL BAND 75-110 GHz	
Fixed	3 dB ±0.5 dB VSWR ≤1.15	FA-10-3
Fixed	6 dB ±1.0 dB VSWR ≤1.15	FA--10-6
Fixed	10 dB ±1.5 dB VSWR ≤1.15	FA-10-10
Fixed	20 dB ±2.0 dB VSWR ≤1.15	FA-10-20
Fixed	30 dB ±3.0 dB VSWR ≤1.15	FA-10-30
Variable	0.5 to 30 dB (min) VSWR ≤1.15	VA-10
BENDS	FULL BAND 75-110 GHz	
	E-Plane 45° VSWR ≤1.15	BE-10-45
	E-Plane 90° VSWR ≤1.15	BE-10-90
	H-Plane 45° VSWR ≤1.15	BH-10-45
	H-Plane 90° VSWR ≤1.15	BH-10-90
COUPLERS	FULL BAND 75-110 GHz	
Cross Guide	Coupling: 20 dB ±2 dB Directivity ≥15 dB VSWR: ≤1.20	CG-10
Directional	Coupling: 3 dB ±1 dB Directivity ≥25 dB VSWR: ≤1.20	DCG-10-3C
Directional	Coupling: 3 dB ±1 dB Directivity ≥30 dB VSWR: ≤1.20	DCG-10-3D
Directional	Coupling: 3 dB ±1 dB Directivity ≥40 dB VSWR: ≤1.20	DCG-10-3E
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥25 dB VSWR: ≤1.20	DCG-10-6C
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥30 dB VSWR: ≤1.20	DCG-10-6D
Directional	Coupling: 6 dB ±1.2 dB Directivity ≥40 dB VSWR: ≤1.20	DCG-10-6E
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥25 dB VSWR: ≤1.20	DCG-10-10C
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥30 dB VSWR: ≤1.20	DCG-10-10D
Directional	Coupling: 10 dB ±1.5 dB Directivity ≥40 dB VSWR: ≤1.20	DCG-10-10E
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥25 dB VSWR: ≤1.20	DCG-10-20C
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥30 dB VSWR: ≤1.20	DCG-10-20D
Directional	Coupling: 20 dB ±2.0 dB Directivity ≥40 dB VSWR: ≤1.20	DCG-10-20E
DETECTOR	Crystal Detector: Tunable; 200 mV/mW; Full Waveguide Band	CD-10
E-H TUNER	75-110 GHz Adjustable VSWR: 20:1 to 1.05:1	EHT-10
LOADS	FULL BAND 75-110 GHz	
Terminations	Power Rating: 0.5 W VSWR ≤1.06	FT-10
Low Power	Power Rating: 10 W VSWR ≤1.15	HPL-10-10
Medium Power	Power Rating: 100 W VSWR ≤1.15	HPL-10-100
High Power	Power Rating: 200 W VSWR ≤1.20	HPL-10-200
High Power	Power Rating: 500 W VSWR ≤1.20	HPL-10-500
PHASE SHIFTER	75-110 GHz; Variable Phase Shifter; 0° to 180°; VSWR: 1.15	VPS-10
SHORTS	75-110 GHz; Tunable: Mechanical Range: 10 mm; VSWR>20:1	TS-10
STANDS	Waveguide Stands (Adjustable Height)	STW-10
STRAIGHTS*	FULL BAND 75-110 GHz*	
	1.0 inch length straight waveguide w/flanges	S-10A
	2.0 inch length straight waveguide w/flanges	S-10B
	3.0 inch length straight waveguide w/flanges	S-10C
	4.0 inch length straight waveguide w/flanges	S-10D
	6.0 inch length straight waveguide w/flanges	S-10F
SWITCHES	SINGLE POLE DOUBLE THROW - 75-110 GHz	
Mechanical	S.P.D.T. 3 Port E-Plane	EPS-10
Mechanical	S.P.D.T. 3 Port H-Plane	HPS-10
TEES	FULL BAND 75-110 GHz	
E-Plane	Balance: ≤0.3 dB Phase Division: 180°	EPT-10
H-Plane	Balance: ≤0.3 dB Phase Division: 0°	HPT-10
E-H Plane	Balance: ≤0.3 dB Phase Division: E=180°/H=0°	EHW-10
Magic	Bandwidth: 20% Unsymmetry: ≤0.5 dB Isolation: 30 dB	HTW-10

MILLIMETER WAVEGUIDE PRODUCTS W-Band (75 to 110GHz) WR-10 (UG 387/UM)

PRODUCT	DESCRIPTION	MODEL
TRANSITIONS	Low Loss Cosine Function Electroformed Transition WR-10 to WR-8	WT10-08
	Low Loss Cosine Function Electroformed Transition WR-28 to WR-10	WT28-10
	Low Loss Cosine Function Electroformed Transition WR-10 to WR-12	WT10-12
	Low Loss Cosine Function Electroformed Transition WR-10 to WR-15	WT10-15
	Low Loss Cosine Function Electroformed Transition WR-10 to WR-62	WT10-62
	Low Loss Cosine Function Electroformed Transition WR-10 to WR-90	WT10-90
	TWISTS	FULL BAND 75-110 GHz
90° Waveguide Twist		TW-10-90
45° Waveguide Twist		TW-10-45
WAVEGUIDE	Copper Waveguide: Unfinished in 1 meter lengths (Inside: 0.10x0.17 inches)	WR-10(1M)

NOTES:

* - Waveguide straights are available in any length up to 36 inches

DELIVERY:

Most full band devices and some narrow band devices are carried in stock. Non-stock items may require up to 60 days for shipment.

ABBREVIATIONS:

B/W = Bandwidth;
PWR = Power

WAVEGUIDE TO COAXIAL ADAPTERS (2.6 to 42GHz)

MODEL NUMBER	FREQ. RANGE (GHz)	WAVE GUIDE (EIA)	FLANGE TYPE	COAXIAL CONNECTOR f-FEMALE m-MALE	VSWR (MAX)	DIMENSIONS (mm)			FIG.
						A	B	C	
WA284-N	2.60-3.95	WR-284	CPR284	N(f)/N(m)	1.25	60.0	65.0	38.0	1
WA229-N	3.60-4.20	WR-229	CPR229	N(f)/N(m)	1.25	60.0	60.0	40.0	1
WA187-N	4.40-5.80	WR-187	CPR187	N(f)/N(m)	1.25	55.0	52.0	36.0	1
WA137-N	5.80-8.20	WR-137	CPR137	N(f)/N(m)	1.25	48.0	45.0	31.5	1
WA112-N	7.70-9.60	WR-112	CPR112	N(f)/N(m)	1.25	45.0	41.5	30.0	1
WA90-N	8.20-12.40	WR-90	UG39/U	N(f)/N(m)	1.25	42.0	40.0	31.0	1
WA75-N	10.0-15.0	WR-75	UBR120	N(f)/N(m)	1.25	38.0	38.0	27.0	1
WA62-N	12.4-18.0	WR-62	UG419/U	N(f)/N(m)	1.25	32.0	27.0	24.5	1
WA284-S	2.60-3.95	WR-284	CPR284	SMA(f,m)	1.25	60.0	49.0	38.0	2
WA229-S	3.60-4.20	WR-229	CPR229	SMA(f,m)	1.25	60.0	44.0	40.0	2
WA187-S	4.40-5.80	WR-187	CPR187	SMA(f,m)	1.25	55.0	38.0	36.0	2
WA137-S	5.80-8.20	WR-137	CPR137	SMA(f,m)	1.25	48.0	31.0	31.5	2
WA112-S	7.70-9.60	WR-112	CPR112	SMA(f,m)	1.25	45.0	28.0	30.0	2
WA90-S	8.20-12.40	WR-90	UG39/U	SMA(f,m)	1.30	42.0	25.5	31.0	2
WA75-S	10.0-15.0	WR-75	UBR120	SMA(f,m)	1.30	38.0	24.5	27.0	2
WA62-S	12.4-18.0	WR-62	UG419/U	SMA(f,m)	1.30	32.0	22.0	24.5	2
WA42-K	18.0-26.5	WR-42	UG595/U	K(f)/K(m)	1.25	30.0	19.1	21.0	3
WA34-K	22.0-33.0	WR-34	UG1530/U	K(f)/K(m)	1.30	30.0	19.1	21.0	3
WA28-K	26.5-40.0	WR-28	UG599/U	K(f)/K(m)	1.30	22.0	17.3	13.7	3
WA28-KL	26.5-30.0	WR-28	UG599/U	K(f)/K(m)	1.20	22.0	17.3	13.7	3
WA28-KM	32.0-36.0	WR-28	UG599/U	K(f)/K(m)	1.20	22.0	17.3	13.7	3
WA28-KH	36.0-40.0	WR-28	UG599/U	K(f)/K(m)	1.20	22.0	17.3	13.7	3
WA22-K	33.0-42.0	WR-22	UG383/U	K(f)/K(m)	1.30	20.0	16.9	13.7	3

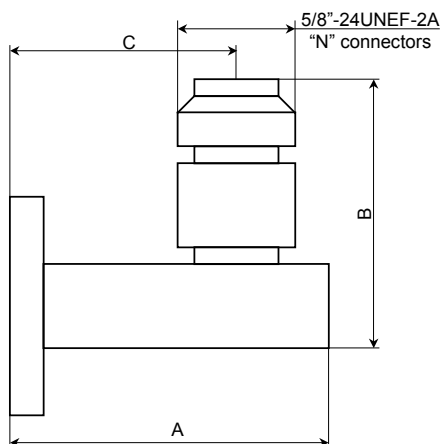


Fig. 1

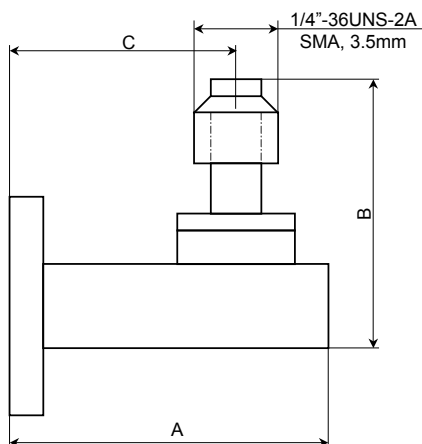


Fig. 2

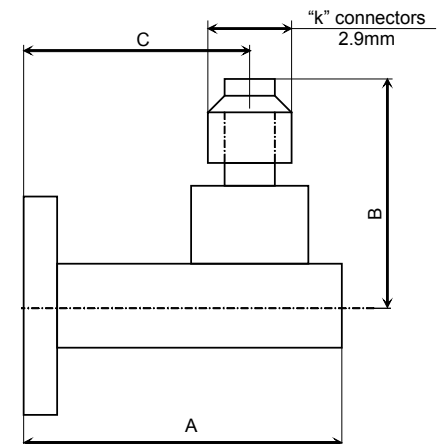


Fig. 3